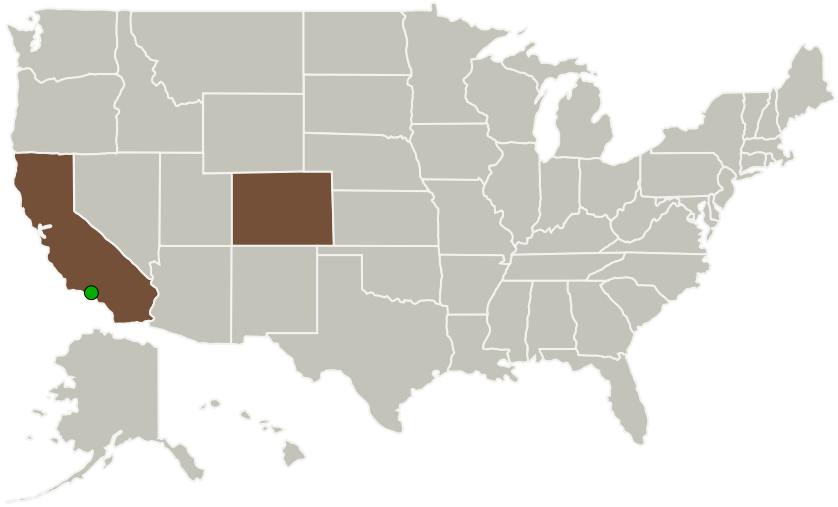
Lunar Borehole Seismometer, Phase I

Completed Technology Project (2016 - 2016)

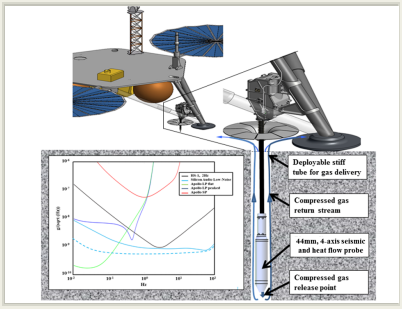
Project Introduction

We propose to adapt a miniaturized borehole seismometer for deployment with a heat probe below the Lunar surface. The heat flow probe has already been designed and tested to reach a depth of 3m and will be installed underground by an existing gas jet drilling method. By burying an innovative, broadband, optical seismometer along with the heat flow probe, we can accomplish all of the goals of a high-mass, high-power surface seismic station with minimal mass and power. While this method currently allows installation at depths of 3m - we make maximum use of this environment - our sensor anticipates possible deployments at much greater depths. In the proposed work we will build and test a full working prototype of this seismometer. We will test it under lunar environmental conditions (vacuum, temperature and simulated regolith), bringing this instrument concept (TRL2) to a tested prototype (TRL4).

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Advanced Seismic Instrumentation and Research	Lead Organization	Industry	Carbondale, Colorado
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California



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Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations	
California	Colorado

Project Transitions

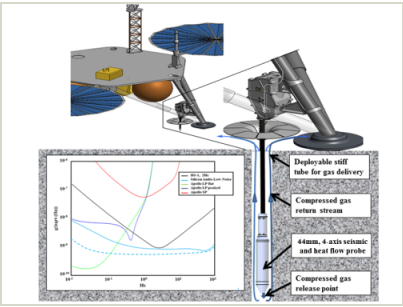
June 2016: Project Start

December 2016: Closed out

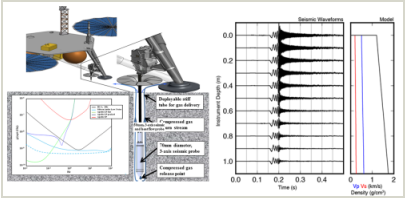
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139654)*

Images



Briefing Chart Image
Lunar Borehole Seismometer, Phase I
(https://techport.nasa.gov/image/136650)



Final Summary Chart Image
Lunar Borehole Seismometer, Phase I Project Image
(https://techport.nasa.gov/image/129928)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Advanced Seismic Instrumentation and Research

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

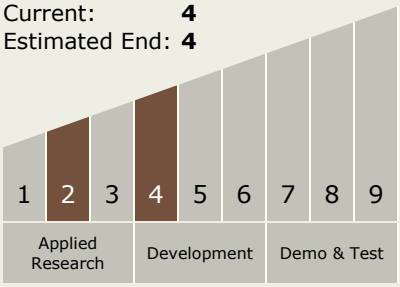
Carlos Torrez

Principal Investigator:

Peter E Malin

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.6 Cryogenic / Thermal

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System